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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,872	12/11/2003	Matti Ryynanen	944-003.200	8080

4955 7590 10/05/2006

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EXAMINER	
SHERMAN, STEPHEN G	

ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/733,872	RYYNANEN, MATTI	
	Examiner	Art Unit	
	Stephen G. Sherman	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed 31 August 2006. Claims 1-25 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-25 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraoka (US 6,538,644) in view of Cok (US 7,042,444).

Regarding claim 1, Muraoka discloses a method for determining a location of an object substantially touching a touch pad, the touch pad having a plurality of surrounding edges, said method comprising:

providing a light sheet over the touch pad such that the light sheet is partially blocked by the object when the object substantially touches the touch pad, wherein the light intensity of the light sheet is spatially varying in such a manner that the blocked intensity is dependent upon the location of the touching object (Figure 5 and column 3, lines 28-37 explain that when a point P is pressed the light waves are blocked and causes a reduced intensity of light reaching the sensor, further the light intensity changes from being at its strongest when closest to the light source to being weaker at the point of the detector, meaning that the light spatially varies across the light sheet.);

disposing a light detecting structure adjacent to at least one of the surrounding edges of the touch pad for measuring the light intensity of the light sheet, wherein the measured light intensity is reduced by the blocked intensity when the light sheet is partially blocked by the touching object (Column 3, lines 28-37 and Figure 1 explain that the sensor array 114 detects the light intensity, and measures a reduction in light when the touch panel is touched.); and

calculating the location of the touching object based on the measured reduced

intensity (Column 3, lines 28-37 explain that a signal is produced by the sensor array which corresponds to a reduction in the transmitted light, and column 4, lines 30-35 explain that by using this output signal it is possible to calculate the depressed location, [*see Figure 7*].).

Muraoka fails to teach of providing a light sheet in an air space over the touch pad.

Cok discloses of a touch screen in which a light sheet is provided in an air space over the touch pad (Figures 1-2 and column 2, lines 25-60 explain that emitters 62 emit light which is reflected off of mirror 66 and provided in air over the surface of a touch pad.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to replace the light sheet taught by Muraoka with the light sheet taught by Cok such that instead of the light being transferred through a polymer sheet it would be transferred in the air in order to reduce the device thickness and minimize the degradation in image quality.

Regarding claim 8, this claim is rejected under the same rationale as claim 1.

6. Claims 2-7, 9-16 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraoka (US 6,538,644) in view of Cok (US 7,042,444) and further in view of Amitai (WO 01/95027).

Regarding claim 2, Muraoka and Cok disclose the method of claim 1.

Muraoka also discloses wherein the light detecting structure is disposed adjacent to a first surrounding edge, and the light sheet is provided by a light providing structure disposed adjacent to a second surrounding edge opposite to the first surrounding edge (Figure 1 shows that the sensor array 114 is provided at one end and the light source 112 is on an opposite side for providing the light sheet.).

Muraoka and Cok fail to teach wherein the light providing structure has a longitudinal axis and a plurality of light providing sections disposed along the longitudinal axis to provide a plurality of light portions of the light sheet such that the intensity of the light portions varies along the longitudinal axis.

Amitai discloses a light providing structure having a longitudinal axis and a plurality of light providing sections disposed along the longitudinal axis to provide a plurality of light portions of the light sheet such that the intensity of light portions varies along the longitudinal axis (Figure 31A contains partial reflecting surfaces 22 which partially reflect light from LEDS 36. The examiner understands that if part of the light is reflected and the other part of the light is not by each of the surfaces 22 that after the light passes through each surface 22 the light reflected will be of less intensity each time.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to make the light source taught by the combination of Muraoka and Cok have the structure of the light source taught by Amitai in order to

create a touch panel that can accurately detect the position of a touch while having a simple configuration.

Regarding claim 3, Muraoka, Cok and Amitai disclose the method of claim 2.

Amitai also discloses wherein the light providing structure comprises:

a light source for providing a light beam along the longitudinal axis (Figure 31A, LEDS 136); and

a plurality of partially reflecting surfaces disposed in said light providing sections to partially reflect the light beam toward the light detecting structure for providing said plurality of light portions of the light sheet (Figure 31A, partially reflective surfaces 22.).

Regarding claim 4, Muraoka, Cok and Amitai disclose the method of claim 3.

Amitai also discloses wherein the light providing structure comprises a plurality of substantially parallel plates having a plurality of interfaces between adjacent parallel plates to provide said partially reflecting surfaces (Page 30, lines 3-7 explain that the surfaces are coated with a coating 160, as shown in Figure 35, in order to create a partially reflective surface.).

Regarding claim 5, Muraoka, Cok and Amitai disclose the method of claim 3.

Muraoka also disclose wherein the light source comprises a laser (Column 4, lines 1-7.).

Regarding claim 6, Muraoka, Cok and Amitai disclose the method of claim 3.

Amitai also disclose wherein the light beam is a substantially collimated light beam (Page 29, lines 5-11 explain that the light beam is collimated by the lenslet array 138 as shown in Figure 31A.).

Regarding claim 7, Muraoka, Cok and Amitai disclose the method of claim 2.

Muraoka also discloses wherein said surrounding edges further comprise a third surrounding edge and an opposing fourth surrounding edge, said method further comprising:

providing a further light providing structure adjacent to the third surrounding edge for providing a further light sheet over the touch pad such that the further light sheet is partially blocked by the object when the object substantially touches the touch pad, wherein the light intensity of the further light sheet is spatially varying in such a manner that the blocked intensity is dependent upon the location of the touching object (Figure 5 and column 3, lines 28-37 explain that when a point P is pressed the light waves are blocked and causes a reduced intensity of light reaching the sensor, and as seen in Figure 1, a second light source 122 is provided on a third surface.);

disposing a further light detecting structure adjacent to the fourth surrounding edge to measure the light intensity of the further light sheet (Figure 1 shows a light sensor 124 adjacent to the fourth surrounding edge for measuring the light intensity of the light from light source 122.),

wherein the measured light intensity of the further light sheet is reduced by the blocked intensity when the further light sheet is partially blocked by the touching object (Column 3, lines 28-37 and Figure 1 explain that the sensor array detects the light intensity, and measures a reduction in light when the touch panel is touched.); and

calculating the location of the touching object also based on the measured reduced light intensity of the further light sheet (Column 3, lines 28-37 explain that a signal is produced by the sensor array which corresponds to a reduction in the transmitted light, and column 4, lines 30-35 explain that by using this output signal it is possible to calculate the depressed location, [*see Figure 7*].).

Regarding claim 9, this claim is rejected under the same rationale as claim 2.

Regarding claim 10, this claim is rejected under the same rationale as claim 3.

Regarding claim 11, this claim is rejected under the same rationale as claim 4.

Regarding claim 12, this claim is rejected under the same rationale as claim 5.

Regarding claim 13, this claim is rejected under the same rationale as claim 6.

Regarding claim 14, Muraoka, Cok and Amitai disclose the system of claim 10.

Amitai also discloses wherein the light source emits light in the visible wavelength region (Figure 31A shows that the light sources are LEDs 136, and LEDs emit light in the visible wavelength region.).

Regarding claim 15, Muraoka, Cok and Amitai disclose the system of claim 10.

Muraoka also disclose wherein the light source emits light in the infrared wavelength region (Column 4, lines 4-7 explain that a laser could be used as the light source, which would emit light in the infrared wavelength region.).

Regarding claim 16, this claim is rejected under the same rationale as claim 7.

Regarding claim 22, Muraoka, Cok and Amitai disclose the system of claim 11.

Amitai also discloses wherein an air gap is provided between two adjacent parallel plates (Page 30, lines 9-11.).

Regarding claim 23, Muraoka, Cok and Amitai disclose the system of claim 11.

Amitai also discloses wherein a substantially transparent bonding material is provided between two adjacent parallel plates (Page 30, lines 3-7 explain that the plates are glued together.).

Regarding claim 24, Muraoka, Cok and Amitai disclose the system of claim 11.

Amitai also discloses wherein the plurality of substantially parallel plates comprise plates made of materials of different refractive indices (Page 29, lines 12-20 explain that the surfaces may be made of polymer or sol-gel materials, each of which would have a different refractive indice.).

Regarding claim 25, Muraoka, Cok and Amitai disclose the system of claim 11.

Amitai also discloses wherein at least a partial reflective coating is provided at each of the interfaces (Page 30, lines 3-7 explain that coatings 160 are provided on each surface).

7. Claims 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraoka (US 6,538,644) in view of Cok (US 7,042,444) and further in view of Graham et al. (US 6,351,260).

Regarding claim 17, Muraoka and Cok disclose the system of claim 8.

Muraoka and Cok fail to teach wherein the light detecting structure comprises:

a light detector for providing the signal; and

a light pipe for receiving at least a part of the light sheet and conveying at least a part of the received light to the light detector.

Graham et al. disclose a touch panel system comprising:

a light detector for providing the signal (Figure 4, processing receiver 408); and

a light pipe for receiving at least a part of a light sheet and conveying at least a part of the received light to the light detector (Figure 4, item 412 receives light sheet 418 and conveys the light to the receiver 408 as explained in column 6, lines 29-48.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the light detection system taught by Graham et al. to replace the light detecting structure taught by the combination of Muraoka and Cok in order to provide an improved user input device that can provide high resolution at moderate cost.

Regarding claim 18, Muraoka, Cok and Graham et al. disclose the system of claim 17.

Graham et al. also disclose wherein the light pipe has a first end, an opposing second end, a longitudinal axis connecting the first end and the second end, and a pipe surface along the longitudinal axis (Figure 4 shows that the light pipe 412 has a first end and a second end with a pipe surface along a longitudinal axis.), wherein the light detector is disposed at the first end (Figure 4 shows the receiver 408 at a first end.), and wherein the pipe surface has diffractive or prismatic surfaces to convey said at least a part of the received light to the first end (Figure 6B shows the structure of a waveguide section which contains waveguides which convey received light to the receiver 408.).

Regarding claim 19, Muraoka, Cok and Graham et al. disclose the system of claim 18.

Muraoka and Graham et al. fail to teach wherein the light detecting structure further comprises a reflecting surface disposed at the second end of the light pipe for directing at least a further part of the received light toward the light detector, however, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to provide a reflecting surface at the second end of the light pipe structure in order to prevent a miscalculation of the light intensity received by the sensor.

Regarding claim 20, Muraoka, Cok and Graham et al. disclose the system of claim 19.

Muraoka and Graham et al. fail to teach wherein the reflecting surface is provided by a mirror disposed adjacent to the second end of the light pipe, however, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use a mirror as the reflecting surface since mirrors reflect light.

Regarding claim 21, Muraoka, Cok and Graham et al. disclose the system of claim 18.

Muraoka and Graham et al. fail to teach wherein the light detecting structure comprises a further light detector disposed at the second end of the light pipe, wherein the diffractive or prismatic surfaces also convey a further part of the received light to the further light detector for providing a further signal so as to allow the computation module to calculate the location of the touching object also based on the further signal, however, it would have been obvious to "one of ordinary skill" in the art at the time the

invention was made to add another detector onto the light pipe in order to provide more accuracy in the detection of when a touch occurs on the touch panel.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS

27 September 2006

AMR A. AWAD
SUPERVISORY PATENT EXAMINER